

# **ABANDONED UNDERGROUND COAL MINE HAZARD ASSESSMENT**

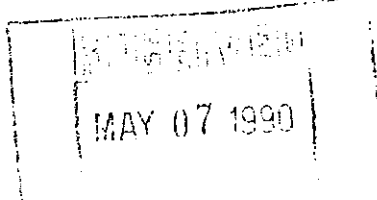
**May 1990**







**HARTCROWSER**



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J-2860

May 3, 1990

Ms. Moira Carr Bradshaw  
City of Tukwila  
6200 Southcenter Boulevard  
Tukwila, Washington 98188

Re: Abandoned Underground Coal Mine Hazard Assessment  
Tukwila, Washington

Dear Ms. Bradshaw:

Hart Crowser is pleased to present this report discussing our assessment of potential hazards related to abandoned coal prospects and mines in Tukwila. Our work was accomplished in general accordance with our proposal dated January 5, 1990. Figure 1 shows the locations of the areas discussed in this report.

The purpose of our work was to document available information on the six areas which the Washington State Department of Natural Resources (DNR) identified for you, as well as identify any other areas where coal mine hazards could be anticipated.

From our review of available information on coal mining activities in the Tukwila area (see Bibliography), we assessed the areas identified by DNR and shown on Figure 1 as:

1. Tukwila Mine (multiple entries);
2. Beacon Hill Mine; and
- 3, 4. Abandoned rock quarries.
5. Strain Coal Company; and
6. Black River Mine.



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Other potential mine hazard areas in Tukwila were identified from 1936 aerial photographs (see Figure 1) but no other evidence of mining was found, as discussed herein.

## **SUMMARY**

Hart Crowser accomplished a historical and geologic review to identify abandoned underground coal mine hazards in Tukwila.

- ▶ Location No. 1, the Tukwila Mine, is the best documented underground coal mine. Subsidence in this area was described to Hart Crowser and it appears there is some risk of future subsidence problems at this location.
- ▶ Locations No. 2 and 6 are abandoned underground coal mines where subsidence has occurred, but these areas are not within the City of Tukwila.
- ▶ Locations No. 3 and 4 are surface excavations (quarries) and no evidence of any underground workings was identified.
- ▶ Location No. 5 is not positively identified as an abandoned mine, but represents a likely location for coal mine workings identified in this general area.

## **HISTORIC INFORMATION**

The following section characterizes efforts to identify mining activities in the Tukwila area using historical information sources.

We reviewed historic clipping files related to mining (at the University of Washington), reports of the State Inspector of Mines, mineral plat records, regional histories, historic maps (U.S. Geological Survey 1900 and 1909; Kroll Map Co., 1920, 1940, and 1958), and an early aerial photo set (King County Assessor, 1936).

No recorded documentation of coal mining activities within the City of Tukwila was located through the historic review for areas other than those previously identified by DNR.



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The presence of coal in the Duwamish-Black River area near Tukwila was known from the early days of settlement in the 1850s. The limited historical discussions indicate that the majority of the finds were opportunistic, namely readily visible coal within formations outcropping in the river floodplain or along bluffs. A small mine was opened on the Black River as early as 1853 and was subsequently noted as being the closest source from Seattle for extractable steamboat coal. The limited description available indicates that this mine was located on the southeast slope of Beacon Hill near Renton, outside the Tukwila study area boundaries.

Recorded surveys of surficial geology within Tukwila City Limits, and logs of water wells available from the Washington State Department of Ecology indicate the area is typically mantled with a thick cover of glacially deposited soils, with only limited bedrock exposure.

The potential for exploiting coal resources in Tukwila was apparently overshadowed by the larger, better known fields elsewhere in King County. A number of these are well documented as having been actively exploited since the 1860s. The Black and Duwamish Rivers served as a transportation corridor for barging coal from the Newcastle area to Seattle. By the late 1870s, the railroad line of the Seattle and Walla Walla Railway Co., extended along the east side of the Duwamish Valley to Renton. This provided cost-effective transportation for the larger mines and probably precluded exploitation of less productive seams. Similarly, coal exploration elsewhere in the county was typically focused in areas adjacent to known coal producing areas, and where bedrock exposures indicated coal likely to be present.

The examination of aerial photos from 1936 and review of the historic maps also did not disclose any specific coal mine features except in areas identified by DNR.

- ▶ None of the geologic or property maps show information indicative of mining activities.
- ▶ The reviewed land ownership maps (within Tukwila) do not indicate names of known companies associated with coal production, companies with names indicative of coal mine ownership, or corporate ownership of lands in areas of known coal outcrops.
- ▶ The Tukwila Mine, Beacon Hill Mine, northern abandoned quarry, and the Black River Mine were noticeable on the aerial photo set. These were noticeable because of pits, mine waste or tailings piles, or cleared areas with possible mine-related activity.



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Two cleared areas of possible mine workings, numbered 7 and 8 on Figure 1, were noted on the photos and are discussed later in this report. A small gravel pit (labeled No. 9) was evident in the SW  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  of Section 35, but did not appear to relate to subsurface activities.

## **ABANDONED MINES AND/OR PROSPECTS**

This section discusses recorded information, Hart Crowser field observations, and anecdotal information on each of the reported or inferred potential coal mine hazard areas.

### ***1. Tukwila Mine***

The Tukwila Mine, located in the SE  $\frac{1}{4}$ , SW  $\frac{1}{4}$  of Section 14, was operated by the Foster Coal Company. From 1932 to 1935, state production records indicate 824 tons of coal were removed (Tim Walsh, 1990) from the mine which consisted of three underground water-level prospects (Waldron, 1962). The mine was reportedly abandoned when the inflow of water into the workings became too rapid. The mine is identified on a 1962 USGS map by Waldron and on a 1932 Map (PK-1) from the Washington State Coal Mine Map Collection. Figure 2 shows the approximate location of the entries at about 75 feet in elevation along the hillside. However, these locations are very rough since they were copied from the 1 inch to two thousand foot scale Waldron map.

The former mine area identified on the map is a steeply sloped, heavily vegetated hillside between 56th Avenue South and Interurban Avenue. Our field reconnaissance identified a linear depression approximately 50 feet long at the bottom of the hillside downslope of 56th Avenue South. At the northern end of the depression, small coal fragments were observed. The depth of the depression could not be determined because of thick blackberry bush overgrowth.

Another, smaller depression was observed near the base of the hillside below the residence on the east side of 56th Avenue South at South 139th Street. The depression measured about 3 feet in diameter and a small opening in its bottom was visible extending into the slope. The extent of the small opening, approximately 1 foot in diameter, could not be determined.



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Although downslope of the mine entries located on the 1962 map, the two depressions appear to be possibly subsidence related, which would suggest entrances to the mine are somewhat farther east.

A local resident, Mrs. Marilyn Patton of 13930 56th Avenue South, told us the porch on the house across the street (13925 56th Avenue) collapsed into a hole about 45 years ago. This hole was described as about 6 feet by 8 feet and 15 feet deep. Mrs. Patton also described a steep gulley between her property and her northern neighbor's, which had a hole at its base. She recalled that the gulley, the opening at its base, and the hole into which the porch collapsed appeared to line up with each other. She believed that these features were probably related to the old abandoned mines. The gulley was reportedly backfilled in the early 1960s. Mrs. Patton indicated that her parents had observed an air chute to the mine oriented across the slope beneath their residence, but the location of this was not identified to Hart Crowser.

We made a rough estimate of the possible extent of workings by assuming a nominal 5-foot by 5-foot mine tunnel size and the reported volume of coal extracted. If mining was accomplished to the same degree from each of the three entries reported by Waldron, maximum length of a single tunnel would likely not exceed about 300 feet. Actual extent of the workings is likely less than this, considering common local coal mining practice of excavating workings in a room and pillar (referred to as "breast and pillar") arrangement rather than single tunnels. However, there is no information on actual extent of workings and any one of the three entries could have extended much further than 300 feet.

Considering apparent dip of the coal seam and topography in the area, depth of cover over a mine tunnel extending into the hillside is estimated to vary from zero at the entry, at an elevation at or below about 75 feet, to about 60 feet or more below 55th Avenue South.

The available recorded information, information obtained from our field reconnaissance and discussion with long-time residents suggest that the hillside below 56th Avenue South and the properties between 55th Avenue and 56th Avenue South should be examined more closely before new or re-development is permitted.

## ***2. Beacon Hill Mine***

The Beacon Hill Mine is located in the NE  $\frac{1}{4}$  of Section 14, South of Seattle in unincorporated King County. According to Waldron (1962), small amounts of coal were mined in the early 1900s, but nothing is known about production. The entry to



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the mine was reportedly still open in 1960, but the tunnel was flooded and inaccessible.

From apparently similar stratigraphy, this mine location in Renton is likely on the same coal seam as the Tukwila Mine, across the Duwamish River. The area had subsidence occur in 1984 which was backfilled by the U.S. Office of Surface Mining. Our reconnaissance included this area but no information was obtained which is pertinent to mine hazards in Tukwila.

### ***3., 4. Abandoned Rock Quarries***

Two of the sites in Tukwila identified by DNR are abandoned igneous (hard rock) quarries which likely were excavated to produce building stone or possibly road material.

The first of two abandoned quarries is located in the NE ¼ of Section 23, west of Interurban Avenue, below South 144th Street. During our field reconnaissance, we observed a very steeply sloped hillside having partially covered outcrops and a lot of broken rock at its base. Waldron's 1962 map identified this area, which is presently undeveloped.

The second quarry identified by Waldron in the SW ¼ of Section 10 is located between Marginal Way South and Highway 599, north of South 124th Street. Our field reconnaissance revealed that this area has been completely developed and is currently a bus base for Metro.

We found no information to indicate any underground excavation or related hazard at either quarry location.

### ***5. Strain Coal Company***

The map PK-1 which we obtained from the Washington State Coal Mine Map Collection indicated an area in the south half of Section 23 and the north half of Section 26 where the Strain Coal Company operated. Available records and discussions with Tim Walsh of DNR, indicate that the Strain Company worked a number of small coal mines in King County at various times (typ. 1930s). However, there are only very poor records of any of the mining activity by the Strain Coal Company. Mr. Walsh felt that workings of Strain Coal Company in Tukwila were probably located in the vicinity of the intersection of Interstate 5 and 405, based on coal that has been observed in the freeway roadcuts.





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A surficial geology map contained in Water Supply Bulletin Number 28 identifies an outcrop of the Puget Group, a coal-bearing formation, in the south half of Section 23, T23N, R4E. No evidence of coal mining was observed in this area during our field reconnaissance. The majority of the area has been developed and the remaining areas are heavily vegetated. Outcrops of weathered sandstone were visible in the roadcut along Southcenter Boulevard at the time of our reconnaissance, but no coal was observed. Local development may already have obscured evidence of mining, if in fact it occurred in this area. The undeveloped area east of Denny's and the Arco Gas State on Southcenter Boulevard had been cleared of vegetation and contained graded slopes of fill.

The closest recorded information on mining activities of the Strain Coal Company are located in Renton, T23N, R5E (Green, 1947), outside the study limits.

#### ***6. Black River Mine***

The Diamond Coal Company operated the Black River Mine located in Renton in the north half of Section 24 at the Black River Junction. The mine, which opened in the late 1880s, closed in 1892. This mine is likely on the same seam as the Beacon Hill and Tukwila Mines to the north, but differences in reported coal bed dip suggest some intervening faults or other bedrock structural changes exist.

According to a report from the Office of Surface Mining, ground subsidence developed at the site in 1984. However, no information pertinent to mine hazards in Tukwila was available.

The area where the entrance to the Black River Mine is believed to be located is presently fenced off by Metro. No information was available to allow us to determine the exact location of the entrance. We did not examine this area during our field reconnaissance as it was outside the city limits of Tukwila.

#### ***7., 8. Other Areas***

Two additional areas were identified by our review of aerial photographs of the Tukwila area, which appeared to be possibly related to mining activities. Because the air photos suggested possible mining, we included these areas in our reconnaissance. However, no mine-related information was found from other sources for these areas.

Area No. 7, located in the NW  $\frac{1}{4}$ , SE  $\frac{1}{4}$ , SW  $\frac{1}{4}$  of Section 26, consisted of a road leading to structures in a gulley along the western valley bluffs of the Green River.



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The aerial photo showed two buildings set on an excavated apron (cut-fill terrace) along the north side midway up the gulley. The terrace area extended further up the gulley where it dead-ended. Our field reconnaissance of the area revealed a gulley with a fenced, large culvert structure at the base of a slope below Interstate 5. Outcrops of weathered sandstone but no coal were observed in the gulley slopes which ranged from 40° to 60°. We found no evidence of mining activities during our field reconnaissance.

Area No. 8 is located in the SW ¼, SW ¼ of Section 3 at the southern base of Cabrini Hill. A small cleared and cut area with one standing structure was identified on an aerial photograph. A review of a USGS surficial geology map of South Seattle, which is now Tukwila (Waldron, 1962), indicates that rock in this area is of a sedimentary nature but not coal-bearing. We were prevented from examining this area in detail during our field reconnaissance because of safety reasons. The Seattle Police Department currently operates a firing range in this area.

Finally, area no. 9 was noted on the air photos as possibly mining-related excavation. Hart Crowser determined this location is a gravel pit, and not coal mine-related.

### ***Conclusions and Recommendations***

From our review of available information, we consider the Tukwila Mine (1.) and the Strain Coal Company workings (5.) to be the most likely areas where coal mine hazards exist or can be anticipated in the City of Tukwila. Mining in Tukwila appears to have been on a smaller scale overall, compared to the extensive workings located in adjacent Renton, because of the generally thick cover of glacial soils and apparently more limited amounts of economically feasible extractable coal.

Except by fortuitous accident, more intensive efforts are unlikely to define the locations of mine entrances and extent of mine workings more accurately, in our opinion.

For future zoning purposes, we recommend the City identify the area of the Renton Formation Outcrop south of 137th Street, shown on Figure 2, as an area of potential mine workings. In our opinion, the City could reasonably require a detailed site reconnaissance by a geologist or engineer to look for indications of mine entrances or workings prior to permitting new construction in this area. Because of uncertainty in the actual location of these mines, you may wish to expand the limits of the outcrop area to include a "buffer zone" of about 200 or 300 feet.



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Although there is risk of undiscovered Strain Coal Company mine workings in the vicinity of the SR-5 and SR-405 interchange, we do not consider the available information sufficient to warrant restrictions on future development in this area. Similarly, we do not recommend development restrictions on any of the other areas in Tukwila discussed in this report.

Hart Crowser appreciates the opportunity to work with you on this assessment of potential abandoned underground mine hazards in the City of Tukwila. Please call if you have questions, or if we can be of additional assistance.

Sincerely,

**HART CROWSER, INC.**

**STEPHEN A. SIEBERT**  
Staff Engineer

**MICHAEL J. BAILEY, P.E.**  
Associate

SAS/MJB:alm/taw/jlm  
interav.lrp

**Attachments:**

**Bibliography**

**Figure 1 - Project Vicinity Map**

**Figure 2 - Portion of Section 14 Showing Vicinity of Reported Tukwila Mine and Related Features**

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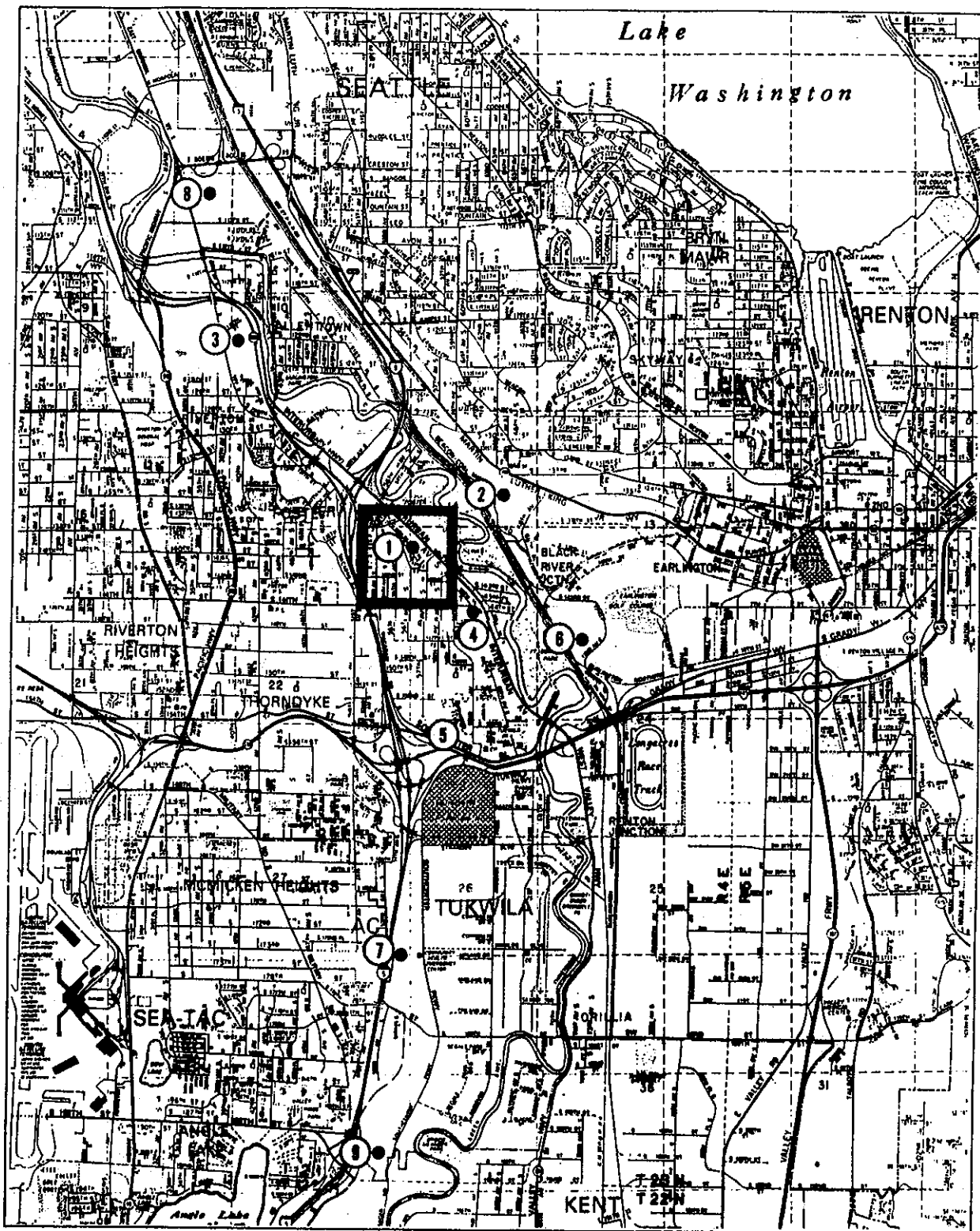
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# Project Vicinity Map

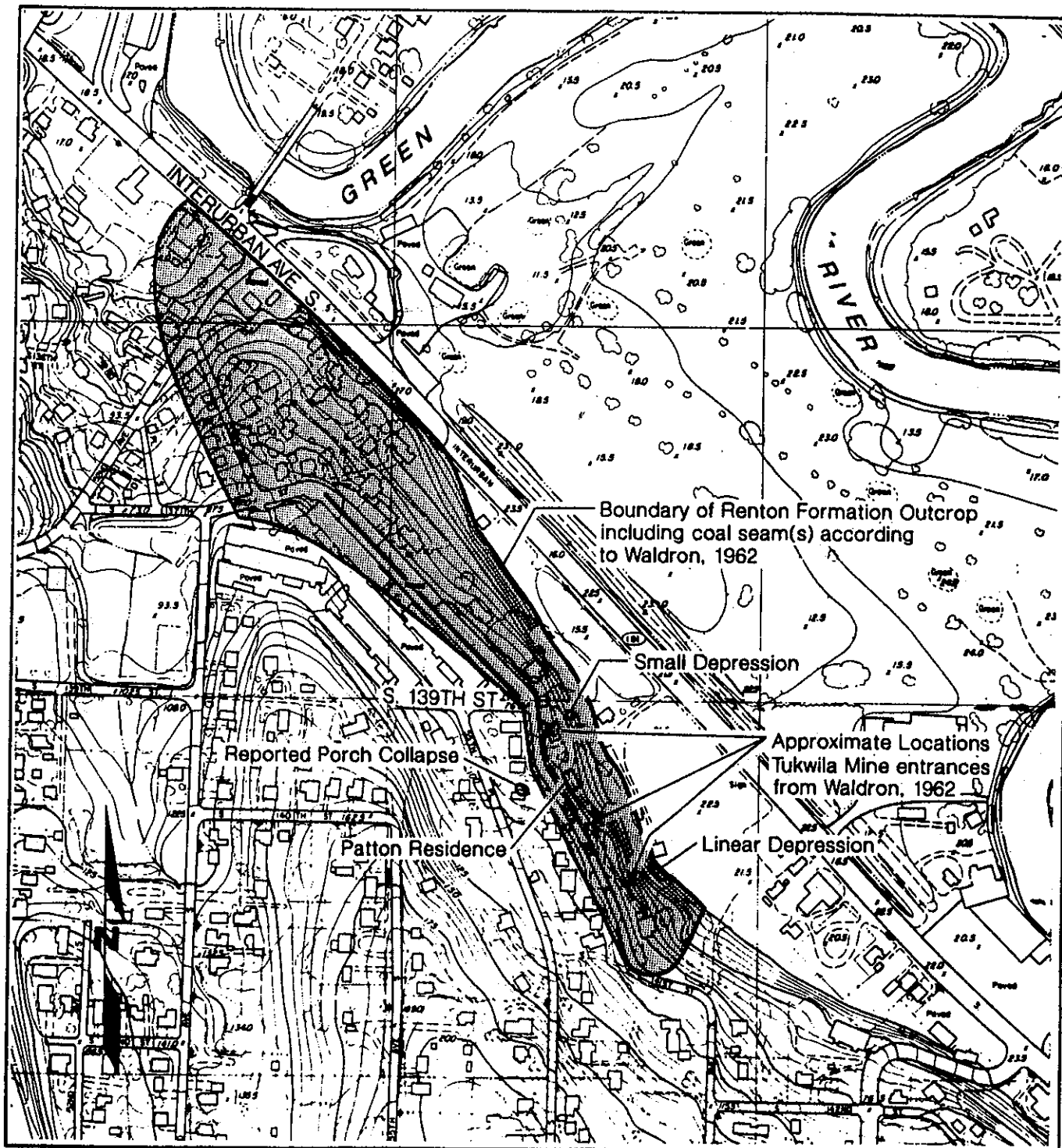


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|--|--|
| ① Tukwila Mine                           | ⑥ Black River Mine                         |
| ② Beacon Hill Mine                       | ⑦ Area Considered as Possibly Mine Related |
| ③ Northern Abandoned Quarry              | ⑧ Area Considered as Possibly Mine Related |
| ④ Southern Abandoned Quarry              | ⑨ Gravel Pit                               |
| ⑤ Strain Coal Company (General Vicinity) |  |
- Refer to Figure 2 for Details

0 1/2 1  
Scale in Miles

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Figure 1

# **Portion of Section 14 Showing Vicinity of Reported Tukwila Mine and Related Features**



Note: Base map prepared from drawing provided by Walker & Associates, Inc., Seattle, WA, entitled "City of Tukwila", undated.

0 400 800  
Scale in Feet



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Figure 2

